

Remarks

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claims 1-4, 6-11, 13-26, 28-30, 32-40, 42-44, 46-48, 50-52, 54-59 and 61-63 have been canceled. Claim 5 has been amended to incorporate the subject matter of claim 1, and claim 12 has been amended to incorporate the subject matter of claim 8, except that amendments have been made to overcome the claim objection and rejections under 35 U.S.C. §112, except as noted below. But for this exception, the claim objection and rejections under 35 U.S.C. §112 have been rendered moot. Insofar as the rejections under 35 U.S.C. §112 are maintained, they are respectfully traversed.

The single exception is based on the term "reactive component". Applicants take the position that this term does not render the claims vague and indefinite.

Chromatography is used to separate a chemical mixture into its component compounds by passing it through a system that retards each component compound to a varying degree. The term "reactive component" recited in Applicants' claims is directed to the component(s) on the reactive layer, which react with the component(s) in the mixture being separated. In other words, the reactive component(s) are the compounds which react with the component compounds of the mixture being separated in order to allow the separation. Therefore, the specific reactive component(s) is not critical to the claimed invention, because the reactive component(s) will differ based upon the mixture being separated.

Therefore, the term "reactive component" does not render the claims vague and indefinite and the rejection should be withdrawn.

The specification and abstract have been amended to be consistent with the amended claims. Additionally, the specification has been amended to delete references to particular claim numbers, therefore rendering moot the objection to the specification.

The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Also attached hereto is a marked up version of the substitute specification and abstract illustrating the changes made to the original specification and abstract.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 1-3, 6-10, 13, 16-18, 24, 25, 28, 29, 32, 38, 39, 50, 57 and 58 under 35 U.S.C. §102(e) as being anticipated by Jobling et al. has been rendered moot by the claim amendments, since this rejection does not include claims 5 or 12, which have been placed in independent form.

The rejection of claims 1-4, 6-11, 13, 14, 16-20, 24-26, 28-30, 32-34, 38-40, 42-44, 50-52, 54, 55, 57-59, 61 and 62 under 35 U.S.C. §102(e) as being anticipated by Chu has been rendered moot by the claim amendments, since this rejection does not include claims 5 or 12, which have been placed in independent form.

The rejection of claims 5, 12, 21-23, 27, 31, 35-37, 41, 45, 53 and 60 under 35 U.S.C. §103(a) as being unpatentable over Chu in view of Yamamoto et al. is respectfully traversed.

The Examiner takes the position that Chu teaches an analytical device and method of making the device. Chu does not teach a surface active agent comprising a sugar in a hydrophilic part of the surface active agent. The Examiner states that Yamamoto et al. teach surface active agents containing sugar in hydrophilic part, and asserts that one of ordinary skill in the art would substitute the surface active agent of Yamamoto et al. for the surface active agent of Chu because Yamamoto et al. teach that this provides for a sensor that facilitates rapid and simplified quantitation of an analyte contained in sample with accuracy.

The presently claimed invention describes a chromatography medium comprising a reactive layer which includes a surface active agent that is solidified when dried, wherein the surface active agent comprises a sugar in a hydrophilic part of the surface active agent.

A reactive layer including a surface active agent which is solidified when dried has increased permeability and a uniform flow when a test sample chromatographically spreads on the chromatography medium, therefore enhancing the reactivity of the chromatography medium. Furthermore, a surface active agent which is solidified when dried also suppresses stagnation of reaction parts, such as a protein fixed on a reactive layer by minimizing the denaturation of the protein, thus providing improved stability.

A surface active agent comprising a sugar in a hydrophilic part of the surface active agent is especially dissolvable to a test sample and is efficient in improving dissolving speed and initiating a uniform flow. Additionally, surface active agents comprising a sugar in a hydrophilic part of the surface active agent have a great ability to suppress denaturing and stagnation of a fixed protein, and therefore cause the chromatography medium to have enhanced stability in long term preservation.

Yamamoto et al. disclose an electric chemical sensor including a surface active agent which comprises sugar in a hydrophilic part, in a reactive layer. The invention of Yamamoto et al. relates to a sensor for measuring cholesterol and includes a surface active agent and an enzyme in a reactive layer in order to promote the reactivity of cholesterol esterase. The base substance of Yamamoto et al. is cholesterol, which is hydrophobic, and therefore it is necessary to make the base substance soluble in order to improve the reactivity of the enzyme. The surface active agent described in Yamamoto et al. works as a soluble agent for the base substance in order to improve the reactivity of the enzyme in the reactive layer and accelerate the progress of the reaction. This role is completely different from the role of a surface active agent used in a chromatography medium, as in the present invention.

Although Yamamoto et al. disclose a sensor in which a surface active agent comprising sugar in a hydrophilic part of the surface active agent is used in a reactive layer, the reference does not provide motivation for including this particular surface active agent in a chromatography medium. Contrary to the Examiner's assertion, there is no teaching or suggestion in Yamamoto et al. to replace the surface active agent of Cho with the surface active agent of Yamamoto et al. Furthermore, the cited combination of references fail to teach that a chromatography medium comprising a reactive layer which includes a surface active agent which is solidified when dried, and which comprises a sugar in a hydrophilic part of the surface active agent will have the advantages shown by Applicants' invention, such as promoting the permeability in the chromatography medium, improving the uniformity of flow, and improving the stability in preserving proteins.

For these reasons, the invention of the pending claims is clearly patentable over Chu in view of Yamamoto et al.

The rejection of claims 15, 46-48, 56 and 63 under 35 U.S.C. §103(a) as being unpatentable over Chu in view of Iwata et al. is rendered moot in view of the cancellation of these claims.

The rejection of claim 49 under 35 U.S.C. §103(a) as being unpatentable over Chu in view of Yamamoto et al. and further in view of Iwata et al. is respectfully traversed.


The rejection over Chu in view of Yamamoto et al. is discussed above.

The teachings of Iwata et al. do not remedy the deficiencies of Chu in view of Yamamoto et al. Since claim 49 is directly dependent on claim 12, which is patentable for the reasons previously stated, the subject matter of claim 49 is patentable over Chu in view of Yamamoto et al. in view of Iwata et al. for the same reasons that the subject matter of claim 12 is patentable over Chu in view of Yamamoto et al.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of objection and rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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